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ABSTRACT

This report discusses trends in education funding over a 40-year period (1950-1990); describes how education dollars are spent; identifies reasons for increases in the cost of education; and offers some observations on the education productivity problem. It also addresses equity issues at both K-12 and postsecondary levels and suggests ways to improve educational outcomes, productivity, and equity. Contrary to public perception, funding for elementary and secondary schools, colleges, and universities has generally increased by substantial margins over the last 40 years. Few if any indicators of student achievement or educational quality has increased at the same rate as funding. The causes of this productivity decline include: (1) the "cost-disease" in labor-intensive activities where costs increase while output is fixed; (2) the "growth force" pressures that attempt quality improvements by service expansion coupled with unavoidable salary and benefit costs; (3) the "administrative lattice" problem of disproportionate increases in administrator and staff pools relative to teachers; and (4) the "academic ratcheting" of classroom norms such as size, planning time, and physical amenities that substantially increase resource demands. To improve their use of resources, elementary and secondary schools should focus closely on outcomes, teacher compensation, decentralizing management practices, and transferring funding to individual schools. To achieve productivity gains, higher education should refocus and prioritize institutional missions. This process relies on enhancing administrative output and decentralizing management authority to departments. Significant changes are needed to improve the productivity and equity of the American educational system. Contains 102 references. (TEJ)

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Funding Schools and Universities:

Improving Productivity and Equity

Allan Odden and William Massy

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CONSORTIUM FOR POLICY RESEARCH IN EDUCATION

Funding Schools and Universities:

Improving Productivity and Equity

Allan Odden and William Massy

November 1992

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Abstract

This report addresses funding, productivity, and equity issues related to K-12 and secondary education. The report draws from research conducted by the Finance Center of the Consortium for Policy Research in Education and other current research.

The report discusses trends in education funding over a 40-year period (1950-1990); describes how education dollars are spent; identifies reasons for increases in the cost of education; and offers some observations on the education productivity problem. The report also addresses equity issues at both K-12 and postsecondary levels and suggests ways to improve educational outcomes, productivity, and equity.

Contrary to public perception, education funding for elementary schools, secondary schools, colleges, and universities increased substantially over the 40-year period. However, there did not appear to be a comparable increase in the quality of education. Some critics charge that education at both K-12 and postsecondary levels actually declined.

Most of the causes of productivity decline in education fall into at least one of four categories:

1. the "cost disease"—a phenomenon associated with labor-intensive activities where costs increase although the output is fixed.

2. the "growth force"—pressure to increase quality by providing more services, combined with "uncontrollable" costs such as rising salaries and benefits.

3. the "administrative lattice"—the phenomenon of middle managers, administrators, and staff increasing at a rate faster than the front-line service providers: classroom teachers.

4. the "academic ratchet"—the norms (such as maximum class size, planning time, and physical amenities) surrounding teacher work that develop over time and end up requiring substantial resources.

The four categories encompass demands for spending increases that may not be directly linked to improved outcomes. Traditional approaches to management and resource use are unlikely to overcome these pressures. If these patterns of expenditures are not changed, productivity will decline and quality is also likely to decrease.

There are strategies, however, that offer hope for improving quality even with only modest resource increases. Schools need to focus more on student achievement; colleges and universities need to refocus their mission on the undergraduate program. Budgets

need to be tied strategically to activities strongly linked to outcomes. Management needs to be decentralized at both levels: to schools in K-12 systems and to schools and academic departments in postsecondary systems. And reward systems could shift focus to knowledge and skills, perhaps with group-based performance bonuses.

Such changes need to be designed carefully. But substantial change is needed to improve productivity and equity in American public education.

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Introduction

Contrary to public perception, education funding for elementary and secondary schools, colleges and universities increased substantially over each of the past four decades, including the 1980s. While funding changes varied by region, state and institution, the overall pattern reflects a consistent trend of strong fiscal support for education. Many education institutions today, however, are cutting budgets (or at least increases in budgets) because of the 1991-92 recession. In the past, such reductions have been followed by growth once the recession ended but there is no guarantee that such behavior will repeat itself. Real resources in the future will depend on the stewardship of today's resources, especially responses to budget cuts when they occur.

Despite the consistent increases in fiscal resources seen earlier, the decade of the 1990s opened with the perception that the educational system had not improved much. Few if any indicators of student achievement or education quality increased at the same rate as fiscal resources. The reform efforts of the 1980s (National Commission on Excellence in Education, 1983) produced only modest K-12 education improvements (Fuhrman, Firestone & Kirst, 1989; Firestone, Rosenblum, Bader & Massell, 1991; Mullis, Owen & Phillips, 1990). At the postsecondary level, several reports argued that the quality of the undergraduate program had declined, there were little data on what students actually learned in college and university programs, and some felt professors were underworked and overpaid (Sykes, 1988). The general feeling was that student achievement at all ages was below expectations, that education programs had declined in quality, and that the substantial educational resource increases had not been used productively.

Concerns about the decline of educational productivity were exacerbated by equity issues. At all levels, there was the perception that equity gains made during the 1970s and early 1980s were beginning to erode. At the elementary/secondary level, the K-12 student achievement gap between minorities and non-minorities had declined substantially (Mullis, Owen & Phillips, 1990; Smith & O'Day, 1991a), but many felt that the more ambitious educational goals for the 1990s would soon begin to widen achievement disparities. In K-12 school finance, moreover, fiscal disparities had changed little since 1980 (Schwartz & Moskowitz, 1988), and at the beginning of the 1990s over half the states were facing legal challenges to their education finance systems. At the postsecondary level, the cost of colleges and universities had soared out of the reach of many families (Hauptman, 1990) and there was a decline in the numbers and percentages of minorities and low-income students attending postsecondary institutions. Cost hikes and a decline in student aid programs had simply eroded access to postsecondary programs (Hauptman, 1990).

This report addresses funding, productivity, and equity issues related to elementary, secondary and postsecondary education. The report draws upon research being conducted by the Finance Center of the Consortium for Policy Research in Education (CPRE).

While there are substantial structural, financial and governance differences between the K-12 and postsecondary levels, our research has identified a number of generic education finance, productivity and equity issues that are similar across levels.

The first section of the report discusses education funding—and funding increases—during the past four decades. The second section describes how education dollars are spent, identifies reasons for the increases in the cost of education and offers some observations on the education productivity problem. Section three suggests ways to improve educational outcomes and productivity. The final section addresses equity issues at both elementary/secondary and postsecondary levels.

Trends in Education Funding

As we've already noted, funding for both K-12 and postsecondary education increased substantially over the last 40 years. This section provides a closer look at those trends.

Elementary and Secondary Education

Two trends characterize changes in K-12 education funding over the past 40 years: change in the sources of education revenues and substantial revenue increases. As shown by Table 1, the share of resources provided by local revenues has dropped while the state (and to a much smaller degree federal) revenue share has increased since 1950. Most of the state increase occurred during the 1970s and 1980s as states sought more aggressively to reduce the fiscal disparities among districts caused by the unequal distribution of the local property tax base (Odden & Picus, 1992). The federal role jumped from 1950 to 1980, largely as a result of the War on Poverty Programs, but then lost nearly half of its gain during the federal retrenchment of the 1980s, standing at just 6.4 percent in 1990.

Table 1
Percent Revenues by Source for U.S. K-12 Public Education: 1950 to 1990

	Year				
Government Level	1950	1960	1970	1980	1990
Federal	2.9%	4.4%	8.0%	9.8%	6.4%
State	39.8	39.1	39.9	46.8	48.7
Local and Other	57.3	56.5	52.1	43.4	44.9

Source: National Center for Education Statistics, *Digest of Educational Statistics: 1990*, Washington, D.C.: U.S. Department of Education, 1989; National Education Association, *Estimates of School Statistics, 1990-91*. Washington, D.C.: National Education Association.

While perceptions about education funding increases are (and probably always have been) bleak (Kirst & Garms, 1980; Odden, 1985), the actual numbers paint a different picture. America has allocated double digit percentage increases in money to schools every decade for nearly half a century (Table 2). The numbers show that both total expenditures (current expenditures plus capital expenditures and debt service) per pupil and current expenditures per pupil have increased in real terms every decade since 1950. During the 1980s, real expenditures per pupil increased 33 percent. The large increase

occurred even though, in the early 1980s, the country experienced one of the most severe recessions during this century.

The substantial increase in both total and current expenditures per pupil during the 1980s was not an anomaly, but simply the continuation of historical patterns. Real current expenditures per pupil increased 35 percent in the 1970s, 69 percent in the 1960s, and 44 percent during the 1950s. For each of the past four decades educational spending per pupil always has risen by at least 33 percent, and by more than double that some decades.

Table 2
Total and Current K-12 Expenditures Per Pupil: 1950 to 1990

	Total Expenditures Per Pupil		Real Decade	Current Expenditures Per Pupil		Real Decade
Year	Nominal	Real	Change	Nominal	Real	Change
1950	$ 260	$ 1472	—	$ 210	$ 1189	—
1960	471	2147	46%	375	1710	44%
1970	955	3386	58%	816	2893	69%
1980	2491	4296	27%	2272	3919	35%
1990	5421	5717	33%	4814	5209	33%

Source: National Center for Education Statistics, *Digest of Education Statistics*, 1991.

This pattern has occurred during periods of enrollment growth (the 1950s and 1960s), enrollment decline (1970s) and enrollment stability (1980s). Moreover, this pattern is true despite the occurrence of recessions which, before the 1980s, tended to happen about every five years.

Unless history completely reverses itself, public school funding per pupil likely will rise again during the 1990s. Funding increases are hard to contemplate during the cuts caused by the 1991 and 1992 recession. But real education revenues also dropped during the recession of 1981 and 1982, yet funding increases for the remainder of that decade more than compensated for the early year losses.

Postsecondary Education

Double digit real increases in expenditures per pupil were also a phenomenon for colleges and universities over the past decade (Table 3). From 1976 to 1987, an era of supposed tax and expenditure limitations, the data show that academic plus administrative expenditures per pupil increased at an annual rate far above inflation, rising by 41 percent

in real terms for higher cost private institutions, 39 percent for the top private research universities and even 23 percent for the top public research universities. The smallest increase was a hefty 19 percent for state colleges and universities, usually the "teaching oriented" postsecondary education institutions.

Table 3
Annual Percentage Change in Postsecondary Education Expenditures: 1976-87
(Constant Dollars for Median Institution in Each Institutional Type)

	Annual (10 Year) Real Percentage Increase in Academic Plus Administrative Expense	
Type of Institution	Total	Per Student
Lowest Cost Private	3.11%	2.36% (26%)
Moderate Cost Private	3.88	3.06 (35)
Higher Cost Private	3.89	3.51 (41)
Private Research Univ (AAU)	4.17	3.38 (39)
Public Research Univ (AAU)	2.98	2.09 (23)
Land Grand	2.56	2.42 (27)
State College/University	2.96	1.76 (19)
United States Total	**3.19%**	**2.42 (27)**

Note: Lowest Cost Private includes private colleges and non-research universities with annual 1988 undergraduate tuition and fees < $7,500. Moderate Cost Private includes private colleges and non-research universities with annual 1988 undergraduate tuition and fees = $7,500 - $9,900. Higher Cost Private includes private colleges and non-research universities with annual 1988 undergraduate tuition and fees > $10,000. Private Research university includes private research universities with membership in AAU. Public Research university includes private research universities with membership in AAU. Land Grant includes land-grant universities and colleges with membership in NASULGC but not AAU. State College/University includes state colleges and universities with membership in AASCU but not NASULGC.

Source: CASPAR Database, National Science Foundation, 1991, as reported in the "Data Profiles" prepared by the Western Interstate Commission for Higher Education (WICHE) and the Pew Higher Education Research Program for the Policy Workshop and Roundtable on Higher Education Financing for Legislators, Higher Education Administrators, and Trustees (San Diego, November 7-9, 1991).

The information shows that across all types of postsecondary institutions, expenditures per pupil rose significantly during this time period. Though not reflected in this table, it turns out that these expenditure increases were accompanied by hikes in tuition rates that also exceeded inflation. Indeed, at many private universities, tuition increases were set at levels that averaged 2 to 4 points above inflation for several years. As a result, revenues and expenditures not only increased, but the cost of private postsecondary education rose beyond the reach of many families (Hauptman, 1990).

Implications for Educational Finance and Productivity

Each decade, the United States increases education spending above inflation at all education levels. The country has a strong history of putting money into education. The policy questions are: Where has it gone? What has it bought? Why have student achievement and program quality not increased in similar percentage terms? How can productivity as well as equity be enhanced, especially with the budgets likely to be given education during the 1990s? The balance of this report focuses on these questions. It draws upon research being conducted by the Finance Center of CPRE and reviews of other current research findings.

Education Spending and the Productivity Problem

Despite differences in structure, governance and funding, the spending behaviors and productivity problems faced by elementary/secondary and postsecondary education are remarkably similar. Both levels see cost increases as largely "out of their control." Both focus on increasing quality by spending more and not by spending differently. Both are caught in the jaws of "norms of operation" that keep pushing up costs without improving academic programs or student learning. Further, at both levels the public perceives that program quality and student learning have not kept pace with resource increases, hence the shared productivity problem.

The primary causes of productivity decline in education can be divided into four categories: (1) the cost disease; (2) the growth force; (3) the administrative lattice; and (4) the academic ratchet (Policy Perspectives, 1990; Zemsky & Massy, 1990). It is important to understand each of these processes in order to properly characterize increasing costs and declining productivity.

The *cost disease* is associated with an activity that is labor-intensive. When general costs or salaries rise, the cost of this activity also rises. An example is the string quartet. It is impossible to play an hour concert in less than four person-hours without a decline in quality. Musicians' salaries must increase with the rise in general salaries in order for the "industry" to remain competitive, which forces up the quartet's costs. Baumol and Blackman (1983) coined the term "cost disease" to describe the phenomenon. The example we gave assumes that technology—the way the service is provided—is fixed. The possibility that the quartet could increase its productivity by selling CDs to subsidize the live performances is not considered.

The *growth force* is the idea that "quality costs" and that any activity, such as education, simply has to grow over time in order to increase quality.

Expanding administration, *the administrative lattice*, is the phenomenon of middle managers and staff increasing at a rate faster than the front line service providers—teachers and professors.

The *academic ratchet* is the evolution of teaching norms that over time produce lower class sizes and teaching loads and more support staff for functions teachers and professors performed in the past. These changes require more resources and altering them either violates contracts or work-place norms.

Elementary and Secondary Education's Productivity Problem

Few would oppose the view that performance at the elementary/secondary level has been stagnant. While an argument can be made that many educational indicators are at an all time high (Bracey, 1991), it is impossible to find outcome data that have increased at the same rate as resources, and most perceptions are that the education system needs dramatic improvement (National Governors' Association, 1991; The White House, 1990).

For example, high school graduation rates rose to about 75 percent in the early 1970s (Rumberger, 1987) and have stayed about the same since then (McMillen & Whitener, 1991). While student achievement for 4th, 8th and 12th graders reversed the decline begun during the late 1970s, by the early 1990s American student achievement was only about where it was in 1972, and American students scored at or near the bottom in most international assessments (LaPointe, Mead & Phillips, 1989; Mullis, Owen & Phillips, 1990). Further, the data show that while most students are doing well on basic skills, only a small proportion (5-10 percent) perform well on the problem-solving and thinking skills required for college work and increasing numbers of jobs in the labor force (Mullis, Owen & Phillips, 1990; Secretary's Commission on the Necessary Skills, 1991). As a result student performance remained flat while real resources rose.

CPRE research shows that the way education dollars are used is partly to blame for low productivity. Resource use reflects the cost disease, growth force, administrative lattice and academic ratchet, practices not powerfully linked either to better quality programs or higher student achievement.

The Cost Disease. Just as a string quartet, elementary and secondary education always has been provided by people—teachers. Real teacher salaries increased in the 1950s, 1960s and 1980s but declined in the 1970s (Odden, 1990b). There is evidence that schools spend the bulk of increased resources on teacher salaries (Barro & Picus, forthcoming). Unless teacher salaries keep pace with overall salary increases in nonschool sectors, schools will attract lower quality individuals and the quality of education programs will fall; hence, the appearance of the cost disease. Indeed, in the 1970s and early 1980s, when teacher salaries dropped in real terms, the quality of teachers entering and remaining in teaching declined (Schlechty & Vance, 1983; Darling-Hammond, 1984).

There also is evidence that the country needs new ideas about how to pay teachers so that the compensation structure can be strategically linked to education productivity. Higher beginning salaries can attract better quality individuals into teaching (Hanushek, 1991; Ferris and Winkler, 1985) and many states have targeted new resources to higher beginning salaries. But Odden and Conley (1992) show that many states have exceeded an attractive beginning teacher salary, have no benchmark for an appropriate beginning salary level, and thus continue to put new resources into increased beginning pay when such resources could be more productively used for other components of the compensation structure. Further, the education- and experience-based salary structures used by most districts do not include strong incentives for teachers to pursue those actions

most likely to dramatically improve student learning (Lawler, 1990). Career ladder programs, the focus of many reforms from the 1980s, also do not provide these incentives (Bacharach, Conley & Shedd, 1986). CPRE research (Odden & Conley, 1992) suggests that alternative pay strategies, such as knowledge and skills-based pay with performance bonuses, could be designed to more closely link teacher pay to actions likely to increase student learning, and thus enhance educational productivity.

The Growth Force. This phenomenon also is evident in elementary and secondary schools. First, even within the academic program, course offerings have expanded. In addition to the core academic courses—mathematics, science, language arts and history/social science—schools have added computer related courses, increasingly sophisticated vocational education training (Education Writers Association, 1992) and are embarking on dramatically expanded laboratory approaches to both mathematics and science. Second, findings from recent CPRE research (Barro & Picus, forthcoming) show that non-classroom expenditures are substantial, and that only about 60 percent of each education dollar is used for direct instruction in the classroom.

However, non-classroom services should not be seen as irrelevant. For example, libraries have expanded from being places to borrow books to being a source of sophisticated library, media, computer and other information services. Third, many districts provide substantially more support for curriculum development than in the past. Schools have also expanded student counseling services, family outreach programs and psychological services. Not only do schools provide breakfast and lunch for many poor students, but also there is now talk of providing a wide range of social services in single locations at or near school sites (Kirst, 1992). All of this is in addition to the substantial costs of building and maintaining school facilities, and the expense of providing safe and efficient transportation to approximately half of our nation's school children.

Classroom services have also changed. Today, they include a variety of extra services for special student groups such as special education for the physically and mentally challenged, compensatory education for the economically disadvantaged, and language services for students who lack English proficiency.

There is nothing inherently harmful about the growth of these services; indeed, it could be and is argued that such services are necessary given student demographics, new knowledge and new technologies. But these services consume resources and thus require increased funding. Further, while there is talk of using new technologies to alter the delivery of educational services, new micro-computer technologies have not yet substantially changed how schools are organized or how faculties teach (Dunham, 1991).

Another aspect of the growth force is what many educators call "uncontrollable" costs, cost increases that simply can not be curtailed, it is argued, by the educational establishment. Rising benefit costs including health and dental programs and increases in liability insurance costs. Even teacher salary increases are good examples. Once full health benefits have been negotiated into teacher salary contracts, school districts must

either fund large increases in premiums or negotiate "give backs" which are usually difficult if not impossible to work out. Thus, the education system often must simply absorb these cost hikes. Districts are also "forced" into teacher salary hikes to maintain their competitive stance with neighboring districts, especially if one district grants an increase significantly above the regional norm.

Indeed, once "uncontrollable costs" and "competition-mandated" regional teacher salary increases are included, the costs of just staying even from one year to the next can be as high as 10 percent, even if the combination of inflation and productivity increases in the larger economy is far below this level. All of these factors represent an active growth force in the schools.

The Administrative Lattice. Rising administrative cost is another alleged consumer of K-12 educational resources; indeed, former Secretary of Education William Bennett popularized this perception by coining the phrase "administrative blob" to characterize the abyss into which increasing amounts of educational resources supposedly are lost. Certain categories of administrative expenditures have increased. For example, nearly all types of categorical programs (special, compensatory, bilingual and vocational education) have produced significant increases in administrative expenditures for these programs, but often such expenditures are not categorized as administrative and are considered services to these special student populations. Many central office functions, moreover, are staffed by "teachers on special assignment" with expenditures recorded in teacher and not administrative categories. Finally, Hannaway (1989) shows that administrators can create their own demand for increased administrative staff, in order to carry out management and staff responsibilities at higher levels of quality.

While certain administrative costs have increased, overall administrative costs may not actually increased much at all. Using national data over several decades, Odden and Picus (1992) concluded that the percent of dollars spent on administration has not changed dramatically over the past four decades. Picus (1991) found that in California, the percentage of district expenditures devoted to administration in unified school districts increased by only 1 percent between 1980-81 and 1985-86. Further, state-by-state school finance research conducted by CPRE (Barro & Picus, forthcoming) shows that spending on general district administration is approximately 2.9 percent of education expenditures and that spending on school site administration is another 5.7 percent of total expenditures. This equals a total of 8.6 percent for administration.

The Academic Ratchet. This phrase pertains to the norms surrounding teacher work that develop over time and, in the long run, require substantial resources. Often, clear connections between these increasing costs and improved program quality or student performance are tenuous. The major factor influencing the academic rachet in the K-12 system is lower class size. Nearly everyone, from teachers and administrators to the public, believes that lower class size is a key route to better quality (Folger, 1989b).

Lower class sizes, thus, become a prime target for spending increased resources. Data over time show that class sizes have dropped dramatically as expenditures have risen (Odden, 1990b). Recent CPRE research (Barro & Picus, forthcoming) shows that, indeed, one of the major uses of greater resources in higher spending states is class size reductions. In fact, it appears that as expenditures per pupil decline, class size increases. This relationship is not perfect however, as certain low spending states like Arkansas and Oklahoma have class size ratios similar to such higher spending states as Pennsylvania and Maryland. Preliminary CPRE findings (Barro & Picus, forthcoming) show that as spending increases by 10 percent, average class size declines by approximately 7 percent. The problem is that lower class sizes are not strongly linked to greater student performance; classes need to be reduced to a 1-1 or 1-2 tutoring context in order to produce large increases in student achievement (Odden, 1990a; Slavin, 1989). Thus overall class size reductions are not a strong productivity enhancing strategy.

Another strong norm of educators is that teachers need to be relieved of nonteaching tasks, such as monitoring the lunchroom and playground, counseling students, creating classroom materials and even grading papers. Over time, staff, (e.g. teacher aides) have been hired to perform these functions, and the "rights" to these resources and new working conditions become codified in union contracts and new norms of the workplace. CPRE research (Barro & Picus, forthcoming) shows that professional and nonprofessional staff constitute a substantial proportion of educational expenditures, and that such expenditures are higher, in absolute and percentage terms, in higher spending districts.

Through a productivity lens, these nonclassroom teacher expenditures can be questioned. Sizer (1989) argues that a better use of nonclassroom professional resources in high schools would be to hire more teachers, reduce the student-teacher contact ratio from 150-1 to 80-1, and have teachers provide counseling and other student support services. Research on teacher aides, moreover, rarely finds a link of such expenditures with increased student performance. A recent example is the class size reduction experiment in Tennessee, which found that student achievement did not increase when teacher aides were added to regular classrooms (Folger, 1990; Folger, 1989a).

The academic ratchet can also be found in recent teacher professionalism proposals for teacher offices, carpeting, teacher secretaries, telephones and computers (see for example, Carnegie Forum on Education and the Economy, 1986). The argument is that these amenities accompany professional occupations, are missing in education, and thus become key new ingredients if teaching is to be transformed from a quasi- to a full profession. It is hard to criticize such positions. However, they represent the academic ratchet at work in the K-12 education system, and would contribute new cost increase pressures, with only tenuous connections to system productivity increases.

Implications of Elementary and Secondary Education's Productivity Problem. The above arguments about low elementary/secondary education productivity are supported by other research. Summaries of education production function research (Hanushek, 1986; Monk, 1989; Monk, 1990) and recent CPRE literature reviews of that

research (Monk, 1991) find few consistent relationships between education dollars (and their increases) and student performance. These findings reflect the lack of clear education goals in the past, and reinforce the rationale for systemic reform (Smith & O'Day, 1991b) as an education policy strategy likely to improve student achievement as well as improve system productivity.

The hard-to-escape conclusion is that while K-12 schooling resources have increased, program quality and student learning have not increased commensurately, and thus system productivity has declined. It seems that new education resources are spent on overall higher teacher salaries, lower class sizes, expanding administration, pull-out instructional programs and other nonclassroom professional staff, and that these resource-uses do not enhance system outcomes much. Until resource use patterns change, elementary and secondary schools will find it difficult to link resource uses to system improvements, and thus produce higher productivity.

Postsecondary Education's Productivity Problem

Cost containment and productivity issues have gained prominence not only in K-12 education but also in higher education. Trustees, administrators and federal and state policymakers are grappling with increasing costs and dwindling resources—a situation that is unlikely to abate in the near future. The impetus for this focus began in the 1980s with a growing frustration over the spiraling cost of college tuition. Students and their parents feared that tuition, especially at private institutions, was placing postsecondary education beyond their reach. Federal and state officials voiced similar concerns, denouncing tuition increases, and escalating budgets for public colleges and universities. They also questioned increased research costs. The target of much of this frustration was institutional leaders and faculty, who were chided for their lack of efficiency and even greed.

Higher education's critics point to a long-term decline in what economists call "gross productivity," which is the ratio of output to cost where output is not adjusted for quality (Baumol, Blackman & Wolff, 1989). The median inflation-adjusted cost per student in U.S. colleges and universities grew by 30 percent between 1976 and 1987 (Table 3). Just to insure that gross productivity did not decline during this time period, quality would also have had to increase by more than 30 percent . Critics claim, and several reports support the claim, that quality—defined as effectiveness in undergraduate education—actually eroded during this time, and certainly did not increase. In the 1980s, they argued that faculty members devoted more time to research and professional activities at the expense of undergraduate education. Moreover, data showed that resources were being channeled into administrative and support services at a more rapid rate than into the academic program (Blasdell, McPherson & Schapiro, 1992; Massy & Wilger, 1991). While one cannot preclude quality increases of more than 30 percent (particularly research output), most observers outside the academy seem to believe that overall productivity (especially the undergraduate experience) has declined.

To the general public and many policymakers, tuition increases and productivity decline are seen as the result of so called "organizational slack," that is, professors teaching only 5-10 hours per week with allegedly large blocks of unassigned and therefore "unused" time. Indeed, images of faculty members teaching only one or two classes per semester has led to charges of waste and fraud. Exposes such as *Profscam* reinforce this notion with claims that American faculty members are "overpaid, grotesquely under worked, and the architects of academia's vast empires of waste" (Sykes, 1988).

Yet those inside the academy testify to the hard work of most professors. Few find any evidence of overt waste despite the schedule flexibility enjoyed by most faculty. When organizational slack does exist, it can represent either poor use of resources or the discretionary time needed to develop innovative ideas that may come to fruition in the future (Cyert & March, 1963). Unfortunately, in professional organizations it generally is difficult to distinguish between legitimate investments in the future and the diversion of resources to personal ends (Massy & Wilger, 1991). While the negative face of organizational slack may explain a small part of higher education's productivity problem, we believe that it is an oversimplification and that other factors offer a more powerful explanation: the cost disease, the growth force, the administrative lattice and the academic ratchet.

The Cost Disease. Applying the "cost disease" to higher education is straightforward. Higher education is labor intensive. Assuming that teaching is provided by professors and that the student-faculty ratio does not increase over time, it follows that teaching costs will at least rise by an amount equal to the general rise in wages for the economy as a whole, which is usually a combination of both inflation and increases in general productivity. Professors' salaries would need to rise by an amount equal to the inflation rate plus the increase in productivity, in order for higher education to remain competitive. Absent internal efficiency improvements, annual cost increases for colleges and universities, then, would be higher than inflation on the basis of the cost disease alone. This conclusion accurately characterizes behavior during the 1980s.

The situation is not without irony. Colleges and universities contribute through research to economy-wide productivity improvements. However, the better it does its job, the more cost pressure it experiences.

The Growth Force. The growth force is another factor in higher education's productivity problem. The idea is that "quality costs," and that institutions should continually attempt to improve quality. This theory, originally articulated by Bowen (1980), is illustrated by the unending production of new knowledge at research institutions. New knowledge leads to the need for increased technology, additional classes, and even new fields of study. Yet old knowledge must still be taught. The effect is a constant layering of new ideas, methods and programs on top of old ones resulting in a constant pressure to add courses, faculty, technology, and facilities to keep pace with expanding knowledge. Accommodating the growth force is relatively easy when enrollments are increasing, but when enrollments are stable, the growth force can outpace

even the most generous income sources. The pressure for constant growth prompted former Stanford President Donald Kennedy to ask, "How can we look so rich, yet feel so poor?"

The Administrative Lattice. Using data obtained from the U.S. Equal Employment Opportunity Commission, Grassmuck (1990) charted the growth of administrative and academic support staffs at colleges and universities. She demonstrated the alarming increase in administrative personnel. She found that administrative staffs grew an average of 60 percent between 1975 and 1985. By contrast, faculty increased by an average of less than 6 percent for the same time period. Significant increases in administrative staffs occurred at all types of institutions, not just large research universities. The result of this increase in administrative and academic support services has been "an extension of the scale and scope of an administrative lattice that has grown, much like a crystalline structure, to incorporate ever more elaborate and intricate linkages within itself" (Policy Perspectives, 1990). Several factors are associated with the administrative lattice including: (1) consensus management and risk aversion; and (2) administrative entrepreneurism.

Consensus management has become the norm for conducting business throughout higher education. Administrative and academic support staff personnel are widely consulted on a variety of issues. Although this process has the advantage of being broadly participatory, it has many drawbacks. It is time-consuming to gather input from a significant number of people. Reaching a consensus often requires managers with negotiation skills and accountability is difficult to assign. Consensus management has proven to be very costly. It reinforces the natural bureaucratic tendency toward risk aversion; few individuals are willing to make the tough decisions. The result is a layering of responses which add costs that far outweigh the benefits achieved (Hannaway, 1989; Policy Perspectives, 1990; Massy & Wilger, 1991).

Administrative entrepreneurism also has been a factor in productivity decline. As administrative staffs have increased in size, they have tended to become more professional. One consequence of employing more highly trained individuals has been better management. Institutions have become better able to serve their clientele. An unintended consequence has been that academic and administrative support staffs have taken ownership of their jobs in much the same way that faculty do. They have created their own set of goals and priorities for the institution. Inevitably, one of their goals is to expand their own area (Policy Perspectives, 1990; Massy & Wilger, 1991).

Output Creep and The Academic Ratchet. Although the cost disease, the growth force, and the administrative lattice help explain higher education's productivity problem, an even more potent force—output creep—is at work as well. Output creep refers to the slow change in product mix observed at many colleges and universities. The American professorate has been revolutionized since World War II. No longer do faculty members devote the majority of their time to teaching and related activities such as academic advising and mentoring. Rather, the primary focus of faculty effort increasingly is

research, scholarship, and other professional activity. The process has been gradual, which is why we have labeled it output "creep."

Not all institutions suffer from output creep to the same extent. The phenomenon occurs most dramatically at elite research institutions, both public and private, where competition for admission allows institutions to dictate the "output mix" that students buy. Higher education is still dominated by colleges and universities whose faculty devote most of their time to teaching or whose institutions, constantly concerned with enrollment and financial matters, are more likely to emphasize the role of professor as teacher. However, the prestigious research institutions receive most of the publicity and to the extent that other institutions emulate their behavior, output creep affects all of higher education.

It also is true that much of the American professorate was educated at research institutions. They carry its culture, spreading it widely throughout higher education. An example is the press in many liberal arts colleges, long known for their student and teaching focus and moderate costs, to become "research" colleges to satisfy the demands of their younger faculty—new graduates of Ph.D. programs in research universities—who have been taught that quality derives primarily from research and publication, not teaching.

Faculty are able to spend more time in self-selected activities (generally research and scholarship) than they did 20 or more years ago because of changes in the curriculum and increases in support staff, augmented in some cases by increases in faculty/student ratios. While external funding pays for some of the augmentation (mostly on the research side), the institution bears much of the responsibility for paying for extra people, to do advising and counseling—once faculty responsibilities. The result is a shift in the output mix paid for by those who provide general institutional funds, from advising and teaching to research and publication. Unfortunately, those payers—e.g. students and their parents, and state and federal policymakers—are taking exception to the new mix. To the extent they do, they perceive institutions as being less cost-effective.

We believe that output creep results from the interaction of several departmental processes, which we collectively characterize as the academic ratchet (Policy Perspectives, 1990). The processes are: (1) pursuit of faculty lines; (2) leveraging faculty time; (3) de-structuring the curriculum; and (4) "enactment" of group norms and internalization of perceived property rights.

Pursuit of faculty lines. Most department chairs list the hiring of new faculty as a top priority. This is true even if enrollments are level. Likewise, most faculty want additional colleagues. The push to hire more faculty is strong whether they are wanted for their ability to enhance department prestige, teach introductory courses, or just increase the intellectual climate of the department.

Leveraging faculty time. It is difficult to achieve productivity increases in labor-intensive industries such as higher education . The primary way in which productivity is

improved is by substituting lower paid individuals with lower levels of training and expertise for those with higher levels of expertise, and assuming equal quality services are provided. In academic departments, this means hiring graduate teaching and research assistants, administrative assistants, secretaries, and technicians to take over certain faculty functions. Using less costly individuals frees up faculty to devote more time to research and other professional activities. But even less costly individuals require more resources. In most cases, therefore, leveraging faculty time drives up the overall costs of higher education.

De-structuring the curriculum. Beginning in the 1960s, students demanded an increased involvement in the structure and content of the curriculum. They wanted to be free to choose from a large menu of courses, unconstrained by traditional sequence requirements. To a large extent, many of their desires have been realized–the curriculum is less structured than it used to be. Whatever its consequences for education, curriculum de-structuring surely has contributed to output creep. Building and maintaining structure requires substantial inputs of faculty time, but time that is now used for research and scholarship.

Enactment of group norms and internalization of perceived property rights. Faculty members in all academic departments possess "enacted norms," which are strong, shared beliefs about their relationship to their environment. On the basis of these norms, they develop certain "property rights" which they believe are inherent in the faculty position and which they use to govern their activities. The process of enactments includes accepting as reality certain behavioral and technological formulations such as student/faculty ratios, number of courses taught per term, the division of teaching between upper and lower division courses, and ideal class size. Norms are strongly rooted in disciplinary professions and often involve comparisons with peer institutions (Massy & Wilger, 1991).

Improving Educational Productivity

Despite the scenario portrayed in the previous section, many are optimistic about the possibilities for increasing education productivity. Further, policymakers, the public, parents and students have a right to ask what they get for increased investments in education. Educators ought to be able to produce and document system improvements in both program quality and student outcomes that result from increased spending. In this section, we propose some initial strategies aimed at increasing educational productivity. We also are quick to note that the strength of these proposals is the subject of ongoing CPRE research. As our research findings unfold over the next several years, we will assess the power of these proposals and suggest more concrete design features and principles for implementing them.

Elementary and Secondary Education

At the elementary and secondary level, there are four interrelated strategies that could be used to improve the future use of increased educational resources: (1) focus on outcomes; (2) change how teachers are compensated; (3) decentralize management; and (4) finance schools rather than districts.

Focus on Outcomes. One reason it has been hard for elementary and secondary schools to be productive is that outcomes have been unclear. As a result, teachers, administrators, schools and districts have been pursuing different goals. Lack of goal clarity has been a real conundrum for education production function research (Monk, 1990). Without clear goals, it is impossible to allocate resources to optimize goal attainment.

However, the national goals adopted in 1990 by the president and the 50 governors provide much clearer direction to education practitioners, leaders and policymakers (The White House, 1990). The goals stress academic performance, especially mathematics and science achievement, and high school graduation. If there were questions in the past about the centrality of student learning, the establishment of these goals by the nation's political leaders can give all actors in the education process definite signals about the key purposes for which resources should be allocated.

The goals should be translated by each state into a "systemic reform" strategy that links goals, curriculum standards, new student performance assessments, instructional materials, teacher professional development (preservice and inservice), finance, management and governance into a coherent set of policy strategies (Smith & O'Day, 1991b). A streamlined set of policy signals hopefully will overcome the shortcomings of the mixed messages and fragmented policies of the past (Fuhrman, Clune & Elmore, 1991; Smith & O'Day, 1991b).

Change Teacher Compensation. Teacher pay consumes most of K-12 education resources. In most districts, teachers are paid on the basis of their education level and years of teaching experience, factors that neither reflect activities likely to produce system outcomes nor are directly linked to system performance. The system could do better. Indeed, the nonschool sector has for many years found ways to link pay to: (1) the knowledge and skills needed to produce organizational outcomes; and (2) to system performance, generally on a group basis (Lawler, 1990). Paying for the person rather than the job, paying for knowledge and skills rather than seniority, group bonuses, gain sharing, profit sharing, and employee ownership are just a few of the phrases that have been used to describe these much more productive approaches to pay.

Elementary and secondary education could well capitalize on these well-documented strategies and link teacher pay much more directly to mechanisms likely to improve educational productivity. Odden and Conley (1992) provide an overview of these new directions and suggest four major changes.

The first is to set a beginning teacher salary benchmark that would make education competitive in regional labor markets. At a minimum the benchmark should be the average beginning salary for all liberal arts graduates. In order for the education system to compete with individuals entering technical, mathematics, science and computer fields, the target should be set at the average salary for all college graduates. The salary benchmark should be "market adjusted" annually to maintain education's competitive stance.

The second is to eliminate, perhaps gradually, the education and experience salary schedule, and replace it with a knowledge and skills-based salary schedule. Education is at best an indirect indicator of teacher knowledge and experience is at best an indirect indicator of teacher classroom skills. A knowledge and skills compensation structure would replace these indirect indicators with direct indicators.

As the National Board for Professional Teaching Standards (1989) board moves to certify advanced, experienced teachers on the basis of their knowledge and skills, and as state teacher boards license teachers on the basis of knowledge and skills (rather than an approved set of university courses), valid and fair tools for assessing knowledge and skills will become available and a knowledge and skills-based pay structure would form the bridge between novice and experienced teacher. Odden and Conley (1992) detail the knowledge and skills that could be included in such a structure. At a minimum, the knowledge and skills should be strongly linked to state (or national) curriculum frameworks (Smith & O'Day, 1991b; National Council on Educational Standards and Student Testing, 1992) designed to have students achieve at a level embodied in the national goals.

CPRE research (Monk, 1991) undergirds this new approach. In analyzing the Longitudinal Study of American Youth (LSAY) data base, Monk is finding positive relationships between teacher course work in the content area being taught (mathematics

and science) and pupil achievement gains in those areas. These results hold when controls are in place for other teacher characteristics (e.g., degree status, experience levels, and undergraduate major). They also hold across different subject areas (mathematics and science) as well as across different years (e.g., sophomore vs. junior). In addition, Monk is finding evidence that pedagogy courses in both mathematics and science taken by teachers have a positive impact on pupil performance. While there are variations in the specifics of the findings both across subject areas and experience levels of teachers, the consistency across different subjects and years is noteworthy, particularly in the light of how inconsistent this type of research has been historically.

The emerging results of these LSAY analyses are in line with some recent studies of teacher knowledge and skills as they relate to pupil performance. Both Ferguson (1991) and Hanushek (1991) reported positive relationships between direct measures of teacher knowledge and pupil performance.

The third, and perhaps most controversial, potential new component of teacher compensation would be annual bonuses based on production of outcomes—student achievement. A variety of bonus programs have been used successfully in the nonschool sector (Lawler, 1990). In most organizations, effective bonuses are provided to groups and not individuals; this design feature is especially appropriate for activities best accomplished collegially through teams, such as education. CPRE research shows that group bonuses are the most appropriate for education (Richards, Melville & Fishbein, 1991; Firestone, 1991) and have been tried successfully in some states (Richards & Sheu, 1991).

Change Educational Management. As most American corporations, most schools are hierarchically organized. But this form of management is one reason why American companies are losing their competitive edge (Lawler, 1992). Therefore, it may not be in the best interests of education. Indeed, decentralized approaches to management that involve employees in a wide range of decision-making are productivity enhancing strategies in the private sector (Lawler, 1986). A more recent economic review of productivity enhancing strategies concluded that a sociological phenomenon—employee involvement, of just about any form—was associated with increased system productivity (Blinder, 1990).

Several CPRE research reports (Johnson, 1991; Mohrman, Lawler & Mohrman, 1991; Hannaway, forthcoming) suggest that a more decentralized approach to educational management is likely to produce better schools and higher goal attainment and thus improved productivity. In a review of schools that produce high levels of student achievement in thinking and problem solving, Johnson (1991) found that teachers were strongly involved in key school decisions, especially curriculum and instruction issues.

Mohrman, Lawler and Mohrman (1991) argue persuasively that the rationale for high employee involvement in the nonschool sector also applies to elementary and secondary schools. From nonschool research, these authors suggest that high involvement is

appropriate when the work done is complex, when the work is best accomplished collegially and when the work faces either uncertainty in its daily tasks or exists in a rapidly changing environment. All three of these conditions apply to schools. Teaching is an intellectually demanding activity (Bacharach & Shedd, 1991; Shulman, 1987; Darling-Hammond, 1991). Teaching is best done collegially and jointly by faculties in schools, rather than in isolation (Little, 1982; Rosenholtz, 1989). Teachers face high levels of uncertainty in their day to day tasks, and exist in a rapidly changing demographic and policy environment.

It appears that high involvement is an appropriate school management strategy. Drawing on earlier research by Lawler (1986), Wohlstetter and Odden (forthcoming) in another CPRE project argue that four key resources should be decentralized to schools: power, knowledge, information and rewards.

Schools need power over the budget and the authority to hire and fire personnel. Schools also need control over staff development to create the teacher knowledge and skills needed to teach a thinking oriented curriculum, as well as to manage program development, implementation and their related costs at the site. Schools also require information on school revenues and expenditures, student achievement, and teacher and student characteristics; disaggregating the current district fiscal accounting structure to the school is an implication of this imperative. Finally, rewards need to be more school based. Knowledge and skills-based compensation structures, and school-based performance bonuses, are new directions in which rewards could move. While few schools currently have these powers, many have aspects of them (Wohlstetter & Buffett, 1992) and CPRE research projects in both the Finance and Policy Centers are assessing their design and impact.

Restructure School Financing. Implementing the above strategies suggests several new directions for funding schools. First, state formulas could shift from a district-based to a school-based finance system, and allocate the bulk of funds directly to the school, coupled with substantial school-based management. Most states could accomplish this change by adding the following phrase to their state aid formulas: "and 85 percent (or some large percent) of these funds shall be allocated directly to the school site." Such a change would necessitate implementation of a school-based fiscal accounting structure, so revenues, expenditures and budgets could be tracked on a school-by-school basis.

Second, states need to identify *schoolwide* strategies that will accomplish the key education goals, cost them out, and provide that amount of dollars for each school. Several CPRE research projects focus on both identifying schoolwide strategies that "work" as well as their implementation and operational costs (e.g., Marsh & Sevilla, 1992). One study beginning in 1993 will attempt to reconceptualize school finance equity at the school-site level, rather than the traditional focus on the district (Berne & Stiefel, 1984; Odden & Picus, 1992). Another project has begun to analyze charter schools (Wohlstetter & Anderson, forthcoming).

Third, states could adopt incentive policies that encourage districts and schools to change teacher compensation structures to include knowledge and skills components, as well as performance bonuses. These new directions also could be accompanied by substantial staff development resources, also allocated directly to the school, to help build the knowledge and skills based capacity needed at each individual school site.

Finally, states could design additional mechanisms to reinforce the attainment of outcomes, including a variety of teacher, school and district incentives, school improvement grants and even school restructuring grants. Incentives are just entering school finance policy (Picus, 1992; Richards & Shujaa, 1990) and show promise for enhancing system productivity.

Such new finance directions fit with a new, proposed judicial remedy for school finance litigation that has been developed by CPRE researcher Clune (1992). This new court requirement, discussed at greater length in the last section, would: (1) require a high level of uniform resources across districts and schools; (2) provide extra compensatory resources for low-income students; and (3) create performance incentives to focus the system more on attaining system goals.

Postsecondary Education

The process of improving productivity for postsecondary educational institutions will not be easy, in no small part because of the climate in which higher education currently operates. Critics such as William Bennett and Charles Sykes have put higher education on the defensive. The situation has been exacerbated by a weakened economy (Policy Perspectives, 1991). Within this less-than-ideal milieu, however, it is possible for institutions to improve productivity. We recommend four steps: (1) refocus the institutional mission; (2) purposefully shape priorities; (3) attack administrative and support service productivity head-on; and (4) decentralize management to academic departments.

Refocus Institutional Mission. The relative affluence of higher education in the 1980s resulted in a blurring of institutional identities. Colleges and universities that once possessed a clear sense of institutional mission lost focus as they tried to become all things to all people. A recent report summarized this trend by claiming that institutions refused "to rule out anything-to resist demands for new programs and services, to say no to donors who want to leave their mark, to forgo entering new ventures or seeking new clientele" (Policy Perspectives, 1991).

To refocus its mission, an institution should prepare a written "mission" or "vision" statement. The statement should be developed by the institution's president and senior leadership, with extensive faculty and board involvement, and the board should adopt the final product as institutional policy. The institution should declare its intention to live by the statement, to establish a clear sense of identity, and to eschew the "muddling of

mission" that has become so familiar in higher education. The statement should be short enough for people to internalize it, yet long enough to raise and answer the questions:

• *Who are our clients?* Who are we supposed to be helping, and for what purpose? To the extent we receive public money (either directly or indirectly through tax benefits) or gifts as general funds, what do the providers think they're paying for? For most institutions, the answers to these questions focus more on undergraduate education than the institution's internal climate might lead one to believe. Assessing and dealing openly with this gap represents an important first step.

• *What do they need from us?* Answering this question requires us to understand our clients in greater depth than is usual in a discipline-oriented institution. For undergraduate education, this means knowing about students as they are—their goals, attitudes, and capabilities—and also the goals of those who provide the funding to educate them.

• *How can we deliver it?* We must come to understand our own capacities as they relate—or might relate—to the needs of our clients. This includes a realistic assessment of strengths and weaknesses, of resource availability, and the ability of our organization to change itself in response to a refocused mission. We must find the right balance between the goals and values we embrace as professionals, and those of our clients and their sponsors.

• *What is our comparative advantage?* The resources available at most colleges and universities could benefit a variety of different clients in a variety of ways. Yet to try to do so would dilute the institution's efforts to the point where little, if anything, is done well. Of the mission elements that meet the above criteria, we must select the ones that we can do best relative to other institutions. We should seek to differentiate ourselves from other colleges and universities, and from related institutions outside higher education in ways that best utilize our strengths and mitigate our weaknesses.

Purposefully Reshape Priorities. Once an institution has refocused its mission, it must formulate a strategy for turning the mission into reality. It is the process of "harnessing the parts so that the parts sum to more than the whole." It requires the ability to link schools and units together, to tie budgets to plans, to match incentives with stated priorities, and to match individual talents to tasks and goals (Chait, 1991). In decentralized and highly professional organizations like colleges and universities, purposefully shaping priorities cannot be accomplished quickly or easily. However, institutional leaders can institute policies, processes, and structures that will produce results over time if pursued diligently. These steps include the following:

• *Target investments to mission; grow by substitution, not adding-on.* An institution must strive for continuous improvement in value received per dollar of academic and administrative program investment. This can be accomplished only by justifying each new budget allocation explicitly in terms of mission. Solving a problem or continuing a program cannot be a sufficient reason for providing funds; a broader set of questions

needs to be asked, including whether the problem must be solved or the program continued. Budget-makers must take advantage of every opportunity to reallocate funds from activities with lower value per dollar to those with higher ones, and they must resist efforts to derail or delay the tough reallocation decisions. Their degree of success in doing this should be a key element in the president's and board's review of the annual budget process.

•*Re-engineer the budget process.* The budget process provides the primary means for shaping priorities. It must be designed to do this job effectively at all institutional levels. Budget processes that allocate funds by line item cannot do this effectively, since they focus on inputs instead of outputs. Processes that are mainly formula-driven cannot be effective either, since the formulas preclude the judgments needed to target investments to mission. An effective budget process will encourage planning in relation to mission, by making such plans the centerpiece of units' budget submissions and paying off (or penalizing) according to the plans' responsiveness and quality. We propose an improvement to the successful "Responsibility Center Budgeting" approach (Whalen, 1991).

Attack Administrative and Support Services Productivity Head-On. Proliferation of the administrative lattice must be halted. Academic program is the "business of the business," and every dollar spent on support represents a dollar less for academic program. Administrative and support service productivity improvement methods have much in common with those used to improve service quality. Moreover, these methods do not differ significantly from those developed for equivalent purposes by business firms under the rubric of "high involvement management." Some practical ways to get started include:

•*Make everyone responsible for quality and productivity.* Quality and productivity are everyone's job, and the institution's leadership should take steps to make sure everyone knows it. The president should organize and launch a program of employee involvement and this should be made a central element of employee goals-setting and performance appraisal. Fundamental principles should include: uncompromising commitment to client service, continuous improvement, working in teams and holding team members mutually accountable, and obtaining regular performance feedback. Broad-based employee teams should address the questions, "Are we doing the right things, and are we doing them right?" at all organizational levels, in all administrative and support service areas. The teams should be guided by knowledgeable and enthusiastic leaders, and supported by appropriate documents and resource people.

• *Institute training programs to inculcate the knowledge, skills and attitudes for increasing work productivity.* There is an extensive literature and body of experience about what is needed and how it can be provided, and the institution should tap the expertise of business-oriented professionals in this regard.

• *Re-engineer the incentive and reward structure for administrative and support service personnel.* Positive rewards and recognition systems can be helpful, but one must also identify and eliminate incentives that work against increased productivity. For example, the practice of basing job classifications on the number of employees supervised provides a strong incentive to add people even when they should be subtracted. Structures favoring management by consensus may feel right in the short run, but too much of this good thing saps the organization's will to challenge the status quo—and thus undermines the drive for continuous improvement. It may also be time to shift to knowledge and skills based pay, including group-based productivity bonuses.

•*Set significant quality and productivity improvement targets and insist that they be met.* Many business firms have reduced administrative and support costs by 20 percent, 30 percent, 40 percent or even more—which simultaneously improving quality. Institutions should not be afraid to set ambitious targets and then work hard to achieve them. The existence of specific targets often is necessary to focus attention and galvanize the organization into action. One must be careful not to voluntarily set a target high enough to produce significant layoffs; usually more can be accomplished through attrition that seems apparent at first. When downsizing is triggered by external events, the institution's leadership should do its best use it as a vehicle for restructuring—even though true restructuring is harder when the organization sees itself in a disaster situation.

•*Benchmark oneself to other institutions.* Productive management depends heavily on two different kinds of benchmarking, both of which are relevant to colleges and universities. "Benchmark institutions" represent well-understood paragons of good practice in one or more areas, practice that is worthy of emulation and that is available for emulation because of the benchmark institution's willingness to cooperate. "Benchmark indicators" provide quantitative measurements of cost levels and performance standards for a range of institutions, which permits a given school to compare its own performance with the distribution of performance levels posted by its peers. For example, knowing the distribution of accounting transactions processed per employee or the maintenance cost per square foot for a particular type of facility can be invaluable when setting targets. Ideally, the performance of institutions that pioneer high involvement management will appear in the databases, thus aiding the propagation of successful techniques.

Reform Academic Departments. The behavioral drivers of output creep in higher education are based mainly in the academic department. The department is considered the fundamental unit of organization in an institution of higher education, regardless of its size or mission. Departments are the gateways to an institution's faculty; any successful attempts to improve productivity and to bring about change in the academic culture must work through departmental channels. The academic department also is the key regulator of faculty behavior. As the primary unit through which rewards and incentives are distributed, the department is the natural center of accountability for the action of its members. It is regarded, quite properly, as the primary agent for maintaining and improving the quality and productivity of undergraduate education. Any attempt to contain

costs while simultaneously maintaining or improving the quality of teaching and learning should begin with an understanding of the dynamics of the academic department.

Academic departments must take responsibility for student learning; this includes defining learning outcomes, developing a coherent undergraduate curriculum with some depth, and measuring progress in meeting educational objectives. In turn, institutions must reward departments that demonstrate commitment and change.

A major CPRE research project is designed to improve our understanding of academic departments and the academic ratchet process, and to suggest specific steps that can be taken to reform departments. We are seeking ways to improve the quality and productivity of undergraduate education without undermining the quality of faculty scholarship that has made our best research universities great. Ideas we are exploring include:

- Encourage departments to develop prospectuses for "client-oriented" undergraduate education programs; test these prospectuses by external review, including review by those who pay for and use the services in question.

- Encourage departments to extend their thinking beyond the discipline and the major, to ask how the department—as a community of scholars—can contributed to the institution's general education goals.

- Reward departments that do a good job by providing resources for implementing the programs. Penalize poor work, or no work at all, by reducing funding for the existing mix of departmental activities.

- Improve the standing and attractiveness of the department chair's role. Develop the chair as a true leader, with a voice in determining institutional goals and responsibility for shaping departmental activities to support of these goals.

- Re-engineer the work allocations and the incentive and reward structure for faculty within departments. Consider the faculty as a professional team rather than a collection of autonomous individuals.

Conclusion. Improving higher education's productivity, with a focus on the quality of the undergraduate program, will not be easy, but it is possible. Campus and system leaders should reshape their institutions to focus more strongly on cost-effectiveness in relation to well-articulated goals, and to accept accountability for their choice of goals. Governing boards should make productivity "Job number 1," finding ways to assist institutional leaders in their tasks and holding them accountable for results. Finally, state and federal governments should motivate and facilitate these efforts, and eliminate bureaucratic obstacles that block their achievement.

Issues of Educational Equity

In addition to productivity, the issue of equity is an important one for both K-12 and postsecondary education.

Elementary and Secondary Education

School finance inequities derive from the way states finance public elementary and secondary schools. In most states, local property tax dollars constitute a significant source of school revenues. Heavy reliance on local property taxes produces fiscal inequities because the property tax base is not distributed equally across school districts. As a result, some districts have a large property tax base per pupil, while others have a small one. At a given tax rate, therefore, districts high in property wealth per pupil raise more money per pupil than districts low in property wealth per pupil. In many states, this unequal ability to raise local revenues varies by as much as 10 to 1.

While a variety of school finance programs can eliminate these local revenue-raising inequities (Odden & Picus, 1992), typical state programs reduce but do not eliminate them. As a result, revenues (from local and state sources) per pupil vary considerably in most states, with a high correlation between per pupil revenues and the local per pupil property tax base. High revenue per pupil districts usually are rich in property wealth per pupil and levy below average tax rates, while low revenue per pupil districts usually are poor in property wealth per pupil and levy above average tax rates.

These fiscal disparities were the subject of several court suits in the 1970s and 1980s, beginning with *Serrano v. Priest* in California (Odden & Picus, 1992). While the U.S. Supreme Court's 1973 decision in *Rodriguez v. San Antonio Independent School District* held that these inequities did not violate the 14th Amendment, cases continued in state courts on the basis of both state equal protection and state education clauses. In about a third of the cases between 1970 and 1990, state courts overturned school finance structures; in the other cases, state courts found that school finance systems, with similar fiscal disparities, did not violate constitutional requirements (Odden & Picus, 1992).

School finance litigation is rampant in the 1990s, with cases active or just decided in over half the states. As the 1980s ended and the 1990s began, supreme courts in Kentucky, New Jersey and Texas overturned school finance systems. A lower court overturned the Minnesota finance system in late 1991, deciding that a 35 percent disparity was unconstitutional. More than earlier cases, recent court cases seem to require that states make expenditures per pupil more uniform across districts (Odden, 1992a; Clune, 1992). The Kentucky court not only overturned the state's finance structure, but also the entire education system. The New Jersey court found the system unconstitutional for the poorest city districts, and required compensatory aid in addition to a more than equal base

level of funding for poor, urban districts. And the Texas court has overruled three legislative proposals, one before it even was enacted.

Within-state school finance fiscal disparities were not reduced much during the past two decades (Schwartz & Moskowitz, 1988; Berne, 1988; Wykoff, 1992) and are substantial. Through several research projects, CPRE research continues to assess school finance disparities within states, and track the implementation and impact of the school finance reforms enacted in Kentucky, New Jersey and Texas. Our studies will identify not only overall fiscal disparities, but also differences in the number and qualities of teachers, programs, curriculum and instruction services. Further, new national district finance data merged with 1990 Census of Population data will allow us to research the factors behind fiscal disparities within states, as well as across all districts in the country.

Interestingly, CPRE studies of the finance reforms in Kentucky, New Jersey and Texas suggest that while the court cases in these states are breaking new ground, the school finance structures enacted in response are not (Adams, 1992; Goertz, 1992; Odden, 1992b; Picus & Hertert, 1992). In all states funding has risen significantly, but the new programs are traditional. They allocate funds to districts rather than schools. The formula generally is a higher foundation program, with a power equalized second tier, and additional and nonpower equalized spending above the second tier is still allowed. While performance incentives were on the books, they have not been designed or implemented. Future research results will show not only the fiscal equity impacts of these programs, but also how districts are using the new resources and how productive the resource use patterns are.

A new equity issue, especially recognizing the site as the service-providing and production unit in K-12 education, is equity at the classroom and school level. Evolving research shows that curriculum and instruction resources not only vary substantially by classroom and school (Denham & Lieberman, 1980; Schwille, et al., 1982) but also that these resources are strongly connected to student achievement (Bryk, Lee & Smith, 1990). Moreover, if the school becomes a major focus for school funding, resource equity at the school level—from dollars to curriculum and instruction resources—arises as a new equity concern. This issue, termed service delivery standards, was a major issue in the deliberations of the National Council on Educational Standards and Student Testing. It is the object of a major CPRE research project that will be conducted from 1993 to 1995.

An additional finance equity issue, especially for an era of national education goals, is the differences in fiscal capacity, tax effort, educational spending and student achievement across the states. CPRE research shows that spending per pupil varies as much across each of the 50 states as it does within most states (Odden & Kim, 1992). Student achievement also differs from state-to-state, but the differences are modest for the only existing comparable measures—student eighth-grade mathematics achievement (Mullis, Dossey, Owen & Phillips, 1991). While CPRE research using socio-demographic and education finance variables could correctly group states into high- and low-achieving categories, the research could not explain large percentages of achievement variation with

school finance variables (Odden & Kim, 1992). The research nevertheless highlighted the existence of interstate differences. Ongoing CPRE research is continuing to probe the causes of achievement differences within and across schools and states, using a variety of educational resource measures and more complex statistical procedures.

Policy Options to Enhance Equity. Fiscal disparities across school districts within states have been the Achilles Heel of state school finance for nearly a decade. There are many school finance formulas that could eliminate the disparities if state legislatures would enact and fund them (Odden & Picus, 1992). However, the politics surrounding school finance equity are complex (Odden &Wohlstetter, 1992). While there is a rich history of school finance reform (Odden & Picus, 1992), few states have enacted finance structures that have produced substantial fiscal equity.

The dilemma might simply be that courts have been insufficiently clear about an acceptable judicial remedy. Indeed, in a recent article, CPRE researcher Clune (1992), an original creator of school finance litigation strategy and the judicial standard of "fiscal neutrality" (Coons, Clune & Sugarman, 1970), argued that fiscal neutrality might have outlived its usefulness. Despite 20 years of litigation and legislative response, the fiscal neutrality standard has not produced greater fiscal equity. Clune concludes that it might be time to create a new judicial remedy. After analyzing trends in recent court rulings, he suggests the following three part judicial remedy:

- provide a high base spending at the 95th percentile for all students
- provide substantial compensatory aid for low-income students; and
- provide a set of performance incentives to spur the system towards producing outcomes.

Clune argues that such a school finance approach would produce substantial fiscal equity across all school districts,[1] would provide extra resources for students from economically disadvantaged backgrounds who need a greater level of services to achieve at acceptable levels, and without being prescriptive would require states to design programs focused squarely on rewarding districts and schools for attaining system goals.

A second approach to improving equity would be to begin gathering data on a school basis that goes beyond dollar measures of revenues and expenditures. The curriculum and instruction resources into which dollars are translated are key determinants of what students learn (Porter, 1991). Systematically gathering and reporting such measures would probably show wide variation across both schools and districts, thus for the first time providing documentation of resource disparities strongly linked to student achievement

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[1]Indeed, if as suggested in the previous section, states also allocated the bulk of all monies directly to schools, such a program also would produce substantial within-district and cross-school equity as well, also an elusive but long-sought goal.

disparities. Systemic reform (Smith & O'Day, 1991b) is a prominent programmatic approach for producing these fairer school resources.

Some thought also must be given to interstate disparities now that the country has embarked on a set of uniform national goals for all students. While there are several broad strategies that could be used to address these issues (Odden & Kim, 1992), it is an issue not yet firmly entrenched on the policy agenda but an issue likely to emerge as the 1990s unfold and annual, increasingly sophisticated achievement data show wide variations across the states in what students know and are able to do.

Finally, these possible new directions on the equity agenda might be further informed by school finance approaches in other countries, which rarely have the district structure between the central government and the school. A national curriculum with tightly linked student examinations and school-based financing might simply have greater possibilities for producing higher levels of fiscal, program and outcome equity than the mixed federal system within our country (Davies, 1992; Cohen & Spillane, 1992). While the United States is not about to change its federal system of public schools, some lessons might be drawn from approaches other countries have taken.

Postsecondary Education

For years, the equity issue has been to provide access to postsecondary education for students from all income backgrounds. If resources for higher education were unlimited, families and policymakers would have the money to finance access and choice for all students and a rich variety of experiences would be available to everyone rather than apportioned on the basis of family wealth or the quality of one's secondary school. However, resources for postsecondary education today are being pinched—as they are for virtually every other government endeavor. The national recession and regional economic downturns, such as in the Northeast and California, have set off budget cutting at publicly funded campuses; similar factors place many private universities under fiscal duress.

While the cost of attending most postsecondary education institutions rose during the 1980s, the maximum amount of federal student aid grants fell in constant dollar terms. As a result, although most students are able to secure sufficient aid to pay for *some* sort of postsecondary program, the options available to low-income and, increasingly, middle-income students, are severely limited. In some states, the opportunity to attend a flagship public institution, let alone any four-year college at all, is closed off to most nonwealthy students. Yet, because most state dollars in higher education are spent for across-the-board tuition subsidies, affluent families that could afford to pay more are not required to and enjoy a large, public subsidy.

Aggressive tuition hikes by private colleges (averaging 1 percent to 2 percent above inflation for the past 15 or so years) and the failure of student aid programs—federal, state and institutional—to close the growing gap have pushed some nonwealthy students

into public institutions. More students from families with above average incomes are attending state research universities, and more students from families with below average incomes are attending other public institutions, particularly community colleges. Private institutions are engaged in a costly competition for a shrinking pool of candidates, while beginning to abandon need-blind admissions policies. Many private elite universities are contemplating massive program cutbacks to offset looming multi-million dollar deficits. Lesser private institutions, some of whose enrollments are hundreds or even thousands below capacity, could fail. If they do, the pressure on publicly funded colleges and universities will increase further.

What hangs in the balance in how policymakers respond is nothing less than the nation's historic commitment to postsecondary educational opportunity regardless of economic background. Also at risk is the nation's well-deserved world-class reputation for supporting high quality postsecondary educational institutions.

Policy Options to Improve Equity. There are several possible routes to improving equity in postsecondary education, even with budget constraints that will remain throughout the 1990s. We suggest both modest and more dramatic proposals.

Modest proposals. The modest proposal is simply to increase student financial aid programs to allow low-income students greater access to postsecondary education opportunities. Nationally, this would entail increasing the Pell Grant program to a much higher level, automatically increasing the level by an annual inflation factor, and perhaps even making the aid an entitlement, thus "protecting" it from the annual vagaries of the budget process. Of course, such a policy would increase the program's cost, the major reason these changes have not been implemented and were excised from the 1992 re-authorization of the Higher Education Act. For states, it would mean increasing state student aid programs when tuitions are raised, which again, because of costs, has been a practice rarely followed in the past (Hauptman, 1992).

A radical approach, ostensibly to increase access, would be to reduce the cost of attendance to zero, as is done in many foreign countries. But again because of budget limits, this results in fewer student "slots" thus actually reducing access in countries that have adopted this approach.

A more dramatic proposal. The more dramatic proposal is to set the price of attending a college or university at full cost, together with a dramatically expanded student aid program (or program of income-contingent loans that would be repaid on the basis of a college graduate's income after they graduate). Indeed, because of the strains on state government budgets which are unlikely to abate even when the economy turns around, this approach— if accompanied by sufficiently expanded student aid programs— is attracting a growing number of supporters (Hauptman, 1992).

One version of this proposal is based on a book written by McPherson and Schapiro (1991) and summarized in a CPRE Policy Brief (CPRE, 1992). The proposal assesses

affordability from the perspective of not only parents and students, but also states and the federal government. The proposal is to increase federal and decrease state spending on higher education, thus enhancing educational opportunities for lower-income students without putting an undue burden on middle- or upper-income students. The proposal is to "federalize" a greater share of the financing of higher education for lower-income students, by setting the maximum federal Pell grant for undergraduate students at a level that approximates the actual annual cost of a year's education at a typical, public two-year college, including residence costs but subtracting a student contribution.

In 1985-86, the educational and general expenditures at public two-year colleges averaged $4,223 and room and board averaged $2,479. Adjusting for inflation between 1985-86 and 1989-90 would bring the total cost to about $7,800. The contribution required of the lowest-income students could be set at a modest $2,000 annually, to be raised from summer work, part-time work during school and loans. The resulting $5,800 grant ceiling is more than double the current maximum of $2,400 and also is considerably higher than what was debated during the re-authorization of the Higher Education Act.

Grant awards would be limited to the net cost to the student of the institution s/he attends and pegged to family income, declining to zero for a typical family with one child in college and an income of $45,000. That is close to the median U.S. income for families whose head is between 45 and 64 years old—the group most likely to have children in college. That also is roughly the income level at which the typical family is expected to contribute $5,800 using current federal methodology. Using an income standard, it should be noted, is different from the "need" standard now employed. Under a "need" standard, raising tuition automatically raises the amount of aid for which a student qualifies. The proposed income standard reduces the capacity of high-priced institutions to "capture" more aid by raising tuition.

The new program would be a dramatic expansion of the Pell grant program and elimination of campus-based direct-loan, supplementary educational opportunity and work study programs. Federal loan programs for higher education also would be reformed. Loans would still be guaranteed but the interest charged would no longer be subsidized. The costs of anticipated defaults would be built into a loan-initiation fee and the money that had gone to subsidizing the loans would be shifted over to the grant program. As a result, students would have to borrow less and their repayment costs would be virtually the same as under the current program.

The proposal would roughly add about $11 billion to the cost of federal student aid programs, but reduce overall government support for higher education. McPherson and Schapiro argue that the availability of more income-tested federal aid will encourage public institutions to raise tuition in order to allow more students to qualify for aid. Depending on the strength of such state responses, the program could potentially save taxpayers as much as $11 billion in expenditures for higher education. The proposal would shift to the federal government a greater share of the burden of paying for the postsecondary education of lower-income students, and shift to parents an increased

burden for middle and upper income students, enhancing access for low-income and minority students but keeping higher education affordable for middle and upper-income families.

Improving access to higher education within the fiscal constraints likely to continue during the 1990s will not be easy. Perhaps slow, incremental but substantial improvements in federal, state and institutional student aid programs can accomplish the task. But the considerable shortage of funds suggests this might not be a likely scenario; in the past, fiscal stress has produced higher tuition and fees and reduced financial aid. The severity of the financial strains affecting higher education just might force more radical change in postsecondary education finance during the 1990s, and a dramatic shift in who pays among the federal government, the states, families and graduated students. A new fiscal equation that improved access for the poor and maintained opportunities for middle and upper-income students would be a major accomplishment.

Summary and Conclusion

American schools, colleges and universities face several fiscal challenges. They need to improve outcomes—student achievement and program quality—with stable or in some cases declining resources. They need to simultaneously enhance equity.

Traditional approaches to management and resource use are unlikely to accomplish these goals. Schools, colleges and universities today are caught in the jaws of the cost disease, growth force, administrative lattice and academic ratchet, demands for spending money in ways not strongly related to system outcomes. If these patterns of expenditures are not altered, productivity will decline and system quality likely will erode.

There are strategies, however, for moving the systems forward, and improving quality even with only modest resource increases. Schools need to focus more on student achievement; colleges and universities need to refocus their mission on the undergraduate program. Budgets need to be tied strategically to activities strongly linked to system outcomes. Management needs to be decentralized at both levels, to schools in the K-12 education system, and to schools and academic departments in colleges and universities. And reward systems could shift to knowledge and skills, perhaps with group-based performance bonuses. These major changes need to be designed carefully. But significant change is needed or the productivity and equity of the American elementary, secondary and postsecondary education systems will not improve.

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